

REMARKS/ARGUMENTS

Favorable consideration of this application and entry of the foregoing amendments are respectfully requested.

Claims 1 and 4 have been revised to define the invention with additional clarity and claims 25-27 have been amended to end with a period. The claims as presented are fully supported by an enabling disclosure. That Claims 1 and 4 have been revised should not be taken as an indication that Applicants agree with any position taken by the Examiner. Rather, the revision is made merely to advance prosecution and Applicants reserve the right to pursue any deleted subject matter in a continuation application.

The Examiner's prior objection to claim 25 on the basis that the "status identifier" was in error is believed moot in view of the identifier now recited. Withdrawal of the objection is requested.

Claims 1, 2, 4, 25, 26 and 28 stand rejected under 103(a) as allegedly being obvious over Papageorgiou et al (WO 00/42057). Withdrawal of the rejection is submitted to be in order for the reasons that follow.

Papageorgiou et al relates to orthogonally protected monosaccharide building blocks and to methods of preparing same. By definition, an orthogonally protected carbohydrate building block is a monosaccharide in which hydroxyl and amine moieties are protected (or masked) in such a manner that the protecting groups can be removed in any order without affecting the remaining protecting groups. This requires that each protecting group be: a) removable and b) susceptible to a unique set of chemistries to which all the other groups are inert. The instant that a second protecting group is

susceptible to the same chemistry that is required to remove the first protecting group – the entire molecule fails to be orthogonally protected. Thus, for example, a molecule containing an unsubstituted benzyl ether and a naphthylmethyl ether is not orthogonally protected because the means available to remove one protecting group will also remove the second protecting group.

Applicants' assertions as regards orthogonality are entirely consistent with the definition given at page 2, lines 19-23, of Papageorgiou et al:

The principle of orthogonal stability requires that only those protecting functions should be used that can be cleaved under different reaction conditions without affecting the other functions present.

Furthermore, attention is directed to claim 1 of USP 6,953,850 (the patent that issued from the US national phase application of WO00/042057). Claim 1 requires that:

...B, C, D and/or E are selected from protecting groups which can be cleaved orthogonally in any order such that the cleavage conditions do not compromise the stability of the other protecting or functional groups on the monosaccharide building block, wherein the protecting groups for the hydroxyl protection are selected from ...

In contrast to the orthogonally protected monosaccharides of Papageorgiou et al, Applicants' compounds are based around a monosaccharide scaffold comprising groups that are specifically designed such that they are not readily removable. That Applicants' claims do not encompass the compounds of Papageorgiou et al will be clear from the comments that follow:

Example 1 of Papageorgiou et al

P 11, Compound VI is an unprotected oligosaccharide, the remainder of the example is generic.

Example 2 of Papageorgiou et al

P14, the unnumbered compound does not fall within the scope of the instant invention because there are 3 hydroxyl groups. Compounds 1 & 2 do not fall within the scope of the instant invention because they contain a 4,6-benzylidene. Compounds 4 & 5 do not fall within the scope of the instant invention because they contain a silyl protecting group. Compounds 1,2,3,4 & 5 do not fall within the scope of the instant invention because the substituent on the C-2 nitrogen does not fall within the definition of N(Z)Y of the present claims.

Example 3 of Papageorgiou et al

P18, Compounds 6,7,8,9,10,11 &12 do not fall within the scope of the instant invention because: i) they all contain an azide moiety at C-2; ii) Compounds 7 & 8 contain a 4,6-benzylidene moiety; iii) Compounds 10 & 11 contain a silyl protecting group; and iv) Compound 11 contains an acyl type protecting group BPCO.

Example 4 of Papageorgiou et al

P21, Compounds 12, 13, 14, 15, 16 & 17 do not fall within the scope of the instant invention because: i) they all contain an azide moiety at C-2; ii) Compounds 13 & 14 contain a 4,6-benzylidene moiety; iii) Compounds 16 & 17 contain a silyl protecting group; and iv) Compound 17 contains an acyl type protecting group BPCO.

Example 5 of Papageorgiou et al

P24, Compounds 18, 19, 20, 21, 22 & 23 do not fall within the scope of the instant invention because: i) the substituent on the C-2 nitrogen does not fall within the definition of N(Z)Y of the present claims; ii) Compounds 20 & 21 contain a 4,6-benzylidene moiety; and iii) Compound 23 contain a silyl protecting group.

Example 6 of Papageorgiou et al

P29, Compounds 25, 26, 27, 28, 29, 30 & 31 do not fall within the scope of the instant invention because: i) Compounds 26, 27, 28, 29, 30 & 31 all contain a silyl protecting group; ii) Compounds 27 & 28 contain a 3,4-isopropylidene moiety; iii) Compound 25 has 4 hydroxyl groups while Compound 26 has 3 hydroxyl groups; and iv) Compound 27 & 28 contain 3,4 isopropylidene groups.

Example 7 of Papageorgiou et al

P33, Compounds 10 & 11 are discussed above. Compound 32 contains a silyl protecting group. Compounds 32, 33, 34, 35 & 36 contain a C-2 azide moiety. Compounds 37, 38 & 39 do not fall within the scope of the instant invention because the substituent on the C-2 nitrogen does not fall within the definition of N(Z)Y of the present claims.

Example 8 of Papageorgiou et al

P38, Compounds 10, 11 are discussed above. Compounds 40, 41, 42 & 43 do not fall within the scope of the instant invention because all of these compounds contain an acyl type protecting group (BPCO) at C-4; Compounds 41, 42 & 43 contain a silyl protecting group at C-6; all of the Compounds contain an azide protecting group at C-2.

Not only does Papageorgiou et al not teach compounds of the present invention, it also would not have rendered obvious the claimed substituted monosaccharides in which the substituents are non-labile. Applicants again submit that it is only with hindsight that one could even contend otherwise.

In rejecting the claimed invention as obvious over Papageorgiou et al, the Examiner states at page 4, lines 7 to 10, of the Advisory Action that:

It is noted that the orthogonal classes of protecting groups exemplified by Papageorgiou et. al. include amino protecting groups such as dichlorophthaloyl and pentenyl that fall within the limits of N(Y)Z in instant claim 1.

With respect, the definition of N(Y)Z in the pending claims does not encompass the protecting groups listed in Papageorgiou et al at page 6, lines 1 to 8. The definition of N(Y)Z in the instant claims requires that Y be selected from a group that does not include hydrogen or alkyl – but must be of the acyl type, while Z is selected from a group that includes hydrogen and alkyl but not acyl types. Therefore, phthaloyl-type protecting groups do not fall within Applicants definition because they contain two acyl type substituents on nitrogen forming a ring; Dde, Wow and pentenyl groups contain alkenyl moieties but no compulsory acyl type (Y) group. The benzyloxycarbonyl protecting group of Papageorgiou et al is also not within Applicants' definition of N(Y)Z – while Z can be hydrogen, $-(C=O)-O-R$ is not an option for Y in Applicants' claims.

Applicants believe that it would be impossible to construct a compound of the instant invention that would be found in Papageorgiou et al. In the first instance, the present invention requires that at least one of the positions R2 to R5 be a hydroxyl group. Papageorgiou et al requires that all of the positions equivalent to R2 to R5 be

orthogonally protected. In the second instance, the mere inclusion of a moiety determined to be suitable for use as a protecting group by Papageorgiou et al in a molecule of the instant invention would not have rendered the molecule obvious.

The Examiner offers the group Y23 in claim 26 as an example of a photolabile moiety. While this group may be photolabile, the Examiner has not provided evidence to support the assertion. Nonetheless, Applicants point out that claim 26 is drawn to a compound of claim 1 in which one of the OR moieties can be OY23. The nitrobenzyl group, which may be photolabile, is also reduction and hydrogenolysis labile. Therefore, all substituted or unsubstituted mono or bicyclic benzyl moieties (e.g., naphthylmethyl) would be precluded from selection for any of the other positions in order to make the compound thus constructed approach the requirements stipulated by Papageorgiou et al. This is because, in order to be orthogonal, the protecting group must be stable to the conditions for manipulating the other protecting groups.

It appears that the Examiner may be arguing that a skilled person could take a compound of Papageorgiou et al and, through a complex series of steps, which are undisclosed and unguided by Papageorgiou et al, construct a compound of the instant invention. Since Papageorgiou et al does explicitly teach the steps required, it appears that the Examiner may be relying on subject matter that he believes to be inherent in the citation. However, obviousness cannot be predicated on what is not known at the time an invention is made. *In re Spormann*, 150 USPQ 449, 452 (CCPA 1966). If the rejection is based on that which the Examiner believes one skilled in the art would recognize to be inherent in the citation, he is requested to so indicate and to provide basis for his position so that Applicants will be positioned to respond.

Finally, the Examiner contends (page 4 of the Advisory Action, last two lines) that Papageorgiou et al discloses that "these synthetic building blocks can be used in library-focused carbohydrate related synthesis". The context in which this statement appears is toward oligosaccharide synthesis and may be taken to mean libraries of oligosaccharides. In any event, no examples or elaborations of this statement are provided - Papageorgiou et al does not teach which compounds to make, nor the steps required to prepare them but, rather, merely invites further investigation.

The Examiner is urged to give careful consideration to the foregoing comments. It is believed that, having done so, the Examiner will find withdrawal of the rejection to be in order and the same is requested.

Claims 1, 2, 4 and 25-27 stand provisionally rejected as allegedly representing obviousness-type double patenting over claims 14-18 of copending Application No 11/813,737. Applicants again note the provisional nature of this rejection and again request that the rejection be held in abeyance until the case is otherwise in condition for allowance.

This application is submitted to be in condition for allowance and a Notice to that effect is requested.

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Respectfully submitted,

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